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initiated as a pilot program in the Mid-Atlantic region in 1997. A Report Card on the health of the nation's ecosystems will be produced by 2001.

KEY ACTION: The National Water Quality Monitoring Council will, by the end of 2000, compare sampling and laboratory methods and protocols leading to performance-based acceptable methods; establish reference parameters for specific monitoring purposes; identify core environmental indicators; establish consistent use of biological metrics; and develop guidelines on quality assurance and control.

KEY ACTION: The National Water Quality Monitoring Council, in coordination with the Committee on Environment and Natural Resources, will publish a national report describing current state of monitoring and models for assessing sources and impacts of polluted runoff; critical gaps and targeted areas in need of monitoring and modeling; priority polluted runoff research and assessment projects; and recommendations for improvements, including institutional roles and reporting of results at watershed, tribal, state, and national levels.

Identify Sources, Transport, and Impacts of Polluted Runoff in Watersheds

More accurate estimates of the sources, transport, and impacts of polluted runoff are needed to guide the implementation of management actions. Effective monitoring of polluted runoff is challenging because of many variables, including intensity of storms, the time of year, and a mosaic

of different environmental settings and land uses. Because of its wide distribution, monitoring alone cannot adequately characterize polluted runoff.

Better survey methods and computerized models are needed, with special attention given to determine the location and relative contribution of sources of nitrogen and phosphorus. This includes isotope studies to pinpoint sources from animal feeding operations versus chemical fertilizers; remote sensing; soil and water sampling devices; and source identification of sediments. Polluted runoff models need to better predict the timing and magnitude of contaminant loads at local, regional, and national scales under alternative land-management strategies because of the time lag between implementation of strategies and improvements in water quality and because of the variability in different environmental settings and land use.

Modeled estimates need to be validated using available water quality data from stations at the mouth of the watersheds. Improved USDA terrestrial surveys and input are needed on forest health, forest and agricultural chemical use, crop production and tillage practices, animal waste disposal practices, animal feeding operations, and basin characteristics that are important to movement of soil and chemicals from land to water. Relative contributions and transport of atmospheric nitrogen are also needed in the modeling process.

KEY ACTION: DOI, USDA, EPA, and NOAA, in concert with the Committee on Environment and Natural Resources and other federal and state agencies, will, by the year 2000, model and produce estimates of